

### **Electron-Ion Collision Studies Using the *Caprice* 14.0 GHz ECRIS.\***

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A new 14.0 GHz electron-cyclotron resonance ion source (ECRIS), the so-called *Caprice* source, has been installed at JPL/Caltech. The source produces ample currents of highly-charged ions for atomic-physics measurements. Studies at JPL are carried out using the source and a three-way beam switcher allowing one to make measurements of absolute electron-ion excitation cross sections using electron energy-loss and merged beams<sup>1</sup>; *f*-values of metastable states using a Kingdon ion trap<sup>2</sup>; and ion-neutral charge-exchange with X-ray detection in a beam line presently being assembled. Recent JPL results will be reviewed, with illustrations to astrophysical phenomena.

\* With J. B. Greenwood and S. J. Smith. Supported by the National Aeronautics and Space Administration through agreement with JPL/Caltech.

<sup>1</sup> C. Liao, S. J. Smith, D. Hitz, A. Chutjian and S. S. Tayal, *Ap. J.* **484**, 979 (1997) (e- *S II*); J. B. Greenwood, S. J. Smith and A. Chutjian, *Phys. Rev. A* (e - *C IV*, submitted).

<sup>2</sup> See preliminary results in A. Chutjian, J. B. Greenwood and S. J. Smith, APS Topical Conference on Atomic Processes in Plasmas (1998, APS Conf. Proc. Series, in press).